

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT (PCT Article 36 and Rule 70)



Applicant's or agent's file reference SCB 806 PCT	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416)	
International application No. PCT/EP 03/10718	International filing date (day/month/year) 26.09.2003	Priority date (day/month/year) 01.10.2002
International Patent Classification (IPC) or both national classification and IPC C07D501/22		
Applicant ANTIBIOTICOS S.P.A. et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 5 sheets, including this cover sheet.

☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

 These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:
 - I ☒ Basis of the opinion
 - II ☐ Priority
 - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - IV ☒ Lack of unity of invention
 - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - VI ☐ Certain documents cited
 - VII ☐ Certain defects in the international application
 - VIII ☐ Certain observations on the international application

Date of submission of the demand 28.04.2004	Date of completion of this report 14.01.2005
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International application No. **PCT/EP 03/10718**

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-12 as originally filed

Claims, Numbers

1-12 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
☐ the language of publication of the international application (under Rule 48.3(b)).
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority in written form.
☐ furnished subsequently to this Authority in computer readable form.
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

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IV. Lack of unity of invention

1. In response to the invitation to restrict or pay additional fees, the applicant has:

- ☐ restricted the claims.
- ☐ paid additional fees.
- ☐ paid additional fees under protest.
- ☐ neither restricted nor paid additional fees.

2. ☒ This Authority found that the requirement of unity of invention is not complied with and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is

- ☐ complied with.
- ☐ not complied with for the following reasons:

4. Consequently, the following parts of the international application were the subject of international preliminary examination in establishing this report:

- ☒ all parts.
- ☐ the parts relating to claims Nos. .

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	8,9,10
	No: Claims	1-7,11,12
Inventive step (IS)	Yes: Claims	
	No: Claims	1-12
Industrial applicability (IA)	Yes: Claims	1-12
	No: Claims	

2. Citations and explanations

see separate sheet

Re Item IV

Lack of unity of invention

Applicant's attention is drawn to the fact that

a) the unitary concept is destroyed by the novelty destroying disclosure of D1 (see following analysis). The features B (nature of the salt) of claims 1, 6 or 7 are known from document D1.

b) The special technical features, representing the contribution over the prior art, as required according to Rule 13.2 PCT is lacking, and the requirement for unity of invention referred to in Rule 13 PCT is not fulfilled.

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Novelty

The present application refers to cefdinir salts of general formula (I) in the form of a salt with i.a. primary amines, secondary amines such as dicyclohexylamine or tertiary amines (see definition of B according to claim 1).

The subject-matter of independent claim 1 (and in particular dependent claims 6 or 7) is however not novel in view of the disclosure of D1 (applicant's attention is drawn to the specific passages quoted in the search report).

Novelty cannot be recognized for the whole subject-matter claimed.

Inventive step

The problem underlying the present application has to be seen in the provision of further intermediates for the production of cephalosporins (in particular cefdinir) as end product which can be recovered in high yield and purity thus improving the manufacture of cefdinir under different aspects (see as listed on page 3, line 15 of the description). The solution resides in the provision of the salts of formula (I) wherein B is ammonia or an organic base, hydrates, solvates or adducts thereof.

D1 already discloses that impure cefdinir may be purified via the formation of a salt, e.g. in crystalline form, therefor the dicyclohexylammonium salt of formula (I) of D1 corresponds to the preferred salt of formula (Ia) according to the present application. Furthermore on page 4 of D1 it is stated that "cefdinir in the presence of other amines, e.g. tert.-octylamine may be degraded" (general basic environment instability). The probable degradation kinetics and isomerization of Cefdinir is investigated in

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details in D2. Consequently, the fact that all conceivable primary, secondary or tertiary amines solve indeed the problem underlying the invention is

- a) not at all prima facie credible and
- b) in fact not supported by data which are solely present for dicyclohexylamine (examples 1 to 3) and methylbenzylamine (example 4).

In order to overcome all the relevant objections raised, following should be carefully considered

- a) the unitary linking concept must be clear define,
- b) the application accordingly restricted in line with the novelty and unitary rendering feature(s) and
- c) the basis (quantitative evidence) on which an inventive step could be recognized must be also supplied/shown.